City of Baltimore Annual Water Quality Report

Baltimore City Department of Public Works

Martin O'Malley, Mayor **George L. Winfield, Director**

Reporting Period: January 1, 2003 to December 31, 2003

INSIDE THIS ISSUE:

Sixth Annual Water Quality Report

This is the sixth edition of Baltimore City's Annual Water Quality Report that we are pleased to make available to our customers. This report for our Water System (**PWSID#: 0300002**) contains information regarding the quality of the water you drink, as well as educational and important public health notices and contacts. The information in this Drinking Water Quality Report, covering the year 2003, is being provided to you in addition to other notices that may be required by law.

Questions about this report and requests for additional copies should be directed to one of the City's Water Quality Laboratories (Ashburton - 410-396-0150 or Montebello - 410-396-6040).

We also wish to take this opportunity to inform you that tours of the treatment plants are again being offered; however, some restrictions may continue to be observed based on ongoing facility security requirements.

This report, along with more information about water quality, system history and common water quality concerns, can be accessed through the Baltimore City Department of Public Works Web Site at:

http://www.baltimorecity.

BALTIMORE CITY BEGINS DRINKING WATER DISINFECTION WITH SODIUM HYPOCHLORITE

During the month of February 2004, the City began operating its first sodium hypochlorite water disinfection system at the Ashburton Water Treatment Plant. The design of additional systems at the two Montebello Water Treatment Plants as well as remote disinfection maintenance facilities are all well under way.

What is sodium hypochlorite?

Basically, sodium hypochlorite, used in large scale water treatment, is a very strong bleach solution. It's about twice the strength of what is commonly available for household use.

Why is the City switching from chlorine gas disinfection to sodium hypochlorite?

The change is taking place because there are risks associated with storing the large amounts of chlorine gas necessary for water disinfection. The risk of a large unintentional gas leak has always been a concern, but today's realities force us to also consider those individuals or groups who may wish to cause harm by bringing about an intentional release. Many facilities across the country are either currently in process of addressing this issue or will have to soon.

Will I notice any difference in my water?

There should be no changes in the aesthetic quality of the water. On an average day at the Ashburton Plant , we will be adding only about 20 gallons of sodium hypochlorite for every million gallons of water treated.

What about the additional sodium?

There should be little change in the overall drinking water sodium levels.

Sodium Hypochlorite Storage Tank at the Ashburton Water Treatment Plant

HIGHLIGHT IN PUBLIC WORKS HISTORY

Gunpowder Falls - Montebello Tunnel

Last year, we received a telephone call from a consumer who had just finished reading the 2002 Water Quality Report and, on impulse, decided to contact us. He suggested we consider including information on the construction of the Gunpowder Falls – Montebello Tunnel in the next report. He told us that he thought others would be interested in finding out more about that project which was completed in late 1940. He also confided that he was one of up to 500 workers who, worked one of three eight-hour shifts, five days a week for nearly four years in order to complete this vital Public Works mission of building a new link from the Loch Raven Dam to the two Montebello Water Treatment Plants.

November 1938 photograph prior to tunnel lining

Construction on this project began during May 1937 after Advisory Engineers on the Water Supply determined that the original tunnel, completed in 1880, could not meet the water demands of a rapidly increasing system population.

The seven-mile-long twelve-foot diameter conduit was built almost entirely through solid rock. Though the task was daunting, progress moved along fairly well averaging about 200 feet each week, or about two-thirds the length of a football field.

The construction was not without tragedy though. At about 6:30 AM on July 20, 1938, a premature dynamite blast killed ten workers and injured six. Approximately two weeks after this unfortunate incident, construction was resumed.

On December 11, 1940, then Mayor Howard W. Jackson opened a valve at the Loch Raven Reservoir that for the first time allowed water to flow into the new tunnel.

On December 23, 1940, the tunnel

Lowering steel plate pipe at the Montebello Shaft

For more information about this and other historic Public Works projects, visit the City's Public Works Museum. *See page*

BALTIMORE CITY WATER QUALITY REPORT FOR 2003

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During the year 2003 the City performed approximately 150,000 water quality analyses, as part of a continuous effort to assure the water you drink meets or exceeds regulatory standards. The water is analyzed for over 90 different drinking water contaminants. A summary of the finished quality results is provided below. The data represents the most recent testing done in accordance with the requirements of EPA's Water Testing Regulations and were the only regulated substances found in your drinking water.

TERMS AND ABBREVIATIONS — What They Mean in Plain English

Term / Abbreviation	Definition	What it Means
PPM	Parts per million	1 ppm is the same as one drop in 10 gallons of water.
PPB	Parts per billion	1 ppb is the same as one drop in 10,000 gallons of water.
HLD	Highest Level Detected	The highest level of a particular contaminant recorded in a test result during the year.
MCL	Maximum Contaminant Level	The highest level of a contaminant allowed by health regulations established by the Environmental Protection Agency.
MCLG	Maximum Contaminant Level Goal	Health related goals. The MCL is set as close to this "goal" as possible but with consideration to achievability and cost.
NTU	Nephelometric Turbidity Units	Units of measurement used to report the level of turbidity or "cloudiness" in the water.
AL	Action Level	If the "Action Level" for a particular contaminant is exceeded, a response that may include additional treatment steps and / or public education may have to be initiated by the water system.
TT	Treatment Technique	A "Treatment Technique" is a required process that is intended to reduce the amount of a specific contaminant in drinking water.
pCi/L	picoCuries per Liter	A measure of the level of radioactivity in the water.
TURBIDITY	Relates to a condition where suspended particles are present in the water.	Turbidity measurements are a way to describe the level of "cloudiness" of the water.
TOTAL / FECAL COLIFORMS	Indicator Bacteria	Type of bacteriological tests routinely used to determine if contamination has occurred in a drinking water system.

MICROBIOLOGICAL CONTAMINANTS

Coliform bacteria indicate the potential presence of disease-causing organisms

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
TOTAL COLIFORMS	0	The Presence of coliform bacteria in more than 5% of monthly samples will exceed the MCL.	Highest monthly percentage of positive samples: 0%	Highest monthly percentage of positive samples: 0%	*Naturally present in the environment.*
FECAL COLIFORMS and *E. COLI*	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. Coli* positive.	Highest monthly percentage of positive samples: 0%	Highest monthly percentage of positive samples: 0%	*Human and animal fecal waste.*

TURBIDITY

Turbidity measurements are a way to describe the level of "cloudiness" of the water

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES
TURBIDITY[1]	None	Treatment Technique (TT)	HLD	LOWEST %	HLD	LOWEST %	*Soil run-off.*
		Filtration	0.17 NTU	100	0.29 NTU	100	

1. Turbidity cannot exceed 1 NTU and must be less than or equal to 0.3 NTU in at least 95% of measurements taken each month. Lowest % is the lowest percentage of monthly filtered water turbidity samples less than 0.3 NTU.

LEAD AND COPPER TESTING

This year's Lead and Copper Testing round involved 51 "tier 1" or high risk homes...

In 1991, the Environmental Protection Agency published the Lead and Copper Rule. This Rule established "action levels" rather than maximum contaminant levels (MCL's) for concentrations of lead and copper at the consumer's tap. In accord with this Rule, if the concentration of either of these metals is found to exceed this action level at a defined percentage of established "tier 1" or high risk residential sample sites, specific actions may be required by the supplier. Tier 1 households are identified as those with copper pipes and lead solder installed after 1982 but before the State ban on such solder. This year's Lead and Copper Testing round involved 51 "tier 1" or high risk homes. To determine compliance, the 51 test results for this year were arranged from the lowest value to the highest. The 90th percentile value is identified by : 51 x 0.9 = 45.9. Therefore, the 46th value , arranged from lowest to highest must be below the "action level" for lead and copper.

LEAD AND COPPER TESTING RESULTS

SUBSTANCE	ACTION LEVEL	90TH PERCENTILE	SAMPLES GREATER THAN ACTION LEVEL
LEAD	15 ppb	10 ppb	4
COPPER	1,300 ppb	283 ppb	0

To minimize your exposure to lead and copper, if the tap has not been used for several hours, it is recommended that you flush your tap for at least 30 seconds before using water for drinking or cooking and don't consume hot water from the tap. To conserve water, consider keeping a container of drinking water in your refrigerator.

Note: the source of lead and copper in drinking water is normally from leaching in individual home plumbing systems and not from source water, water treatment processes or the distribution system. Water treatment processes are in place to minimize this exposure route.

INORGANIC CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES
			HLD	RANGE	HLD	RANGE	
BARIUM	2 ppm	2 ppm	0.02 ppm	<0.02 - 0.02 ppm	0.03 ppm	<0.02 - 0.03 ppm	*Discharge of drilling wastes & metal refineries; erosion of natural deposits.*
NITRATE (AS NITROGEN)	10 ppm	10 ppm	2.03 ppm	0.83 - 2.03 ppm	2.31 ppm	1.21 - 2.31 ppm	*Run-off from fertilizer use; leaching from septic tanks; erosion of natural deposits.*

FLUORIDE

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT			MONTEBELLO PLANTS			MAJOR SOURCES
			HLD	RANGE	AVERAGE	HLD	RANGE	AVERAGE	
FLUORIDE	4 ppm	4 ppm	1.39 ppm	0.25 - 1.39 ppm	0.98 ppm	1.55 ppm	<0.1 - 1.55 ppm	0.81 ppm	*Water additive that promotes strong teeth; erosion of natural deposits.*

RADIOACTIVE CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
BETA PHOTON EMITTERS	0 mrem/yr	50 pCi/L*	3+/-2 pCi/L	3+/-2 pCi/L	*Erosion of natural deposits.*
ALPHA EMITTERS	0 pCi/L	15 pCi/L	<1 pCi/L	1+/-1 pCi/L	*Erosion of natural deposits.*

**The MCL for Beta Photon Emitters is 4 millirems per year (a measure of radiation absorbed by the body). The Environmental Protection Agency considers 50 pCi/l to be a level of concern for this contaminant.*

VOLATILE ORGANIC CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT			MONTEBELLO PLANTS			MAJOR SOURCES
			HLD	RANGE	AVERAGE	HLD	RANGE	AVERAGE	
TOTAL THM'S	N/A[1]	80 ppb*	91 ppb	1 - 91 ppb	54 ppb	104 ppb	21 - 104 ppb	57 ppb	*By-product of drinking water chlorination.*
HAA(5)	N/A[1]	60 ppb*	65 ppb	2 - 65 ppb	29 ppb	69 ppb	2 - 69 ppb	28 ppb	*By-product of drinking water chlorination.*

1. Not applicable because there are individual MCLG's for individual THM's and HAA(5)'s.

**The MCL's for Total Trihalomethanes and Haloacetic Acids are currently based on a running annual average of values computed quarterly - not individual values.*

SYNTHETIC ORGANIC CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES
			HLD	RANGE	HLD	RANGE	
DI(2-ETHYLHEXYL) PHTHALATE	0 ppb	6 ppb	2.94 ppb	<0.5 - 2.94 ppb	2.15 ppb	<0.5 - 2.15 ppb	*Discharge from rubber and chemical factories.*

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly citizens, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Cryptosporidium (crip-toe-spor-ID-ee-um) is a protozoan, a single-celled parasite that can invade and reside in the intestines of animals and people. This organism is found in some surface water: lakes, reservoirs, rivers, etc., and also groundwater under the influence of surface water. Infection of healthy individuals by this organism can cause a gastrointestinal illness referred to as cryptosporidiosis (crip-toe-spor-id-ee-O-sis), which may produce symptoms including diarrhea, headache, abdominal cramps, nausea, vomiting and low-grade fever. The symptoms usually last one to two weeks.

For immunocompromised people, however, the infection can continue and last for several months. Because there are no effective medical treatments, prolonged infection can be fatal for severely immunocompromised individuals. Human transmission routes include ingestion of contaminated food or drinking water or through direct contact with contaminated fecal matter.

The City monitors its raw water sources for the presence of Cryptosporidium using the services of environmental laboratories employing the latest available and approved analytical methods. Analyses for cryptosporidium performed in the year 2003 on water samples obtained from each of the City's raw water sources (see page #4 of this report)

Microscopic view of Cryptosporidium oocysts

Consumers should be aware that drinking water, including bottled water, might reasonably be expected to contain at least small amounts of some contaminants…

How Can Impurities Get in the Water Supply?

As water travels over the surface of the land, it dissolves naturally-occurring minerals and can pick up substances resulting from the presence of animals or from human activity. Contaminants may include: Viruses and bacteria that may come from sewage treatment plants, septic systems, livestock, and wildlife; salts and metals that can be naturally-occurring or result from storm water run-off, wastewater discharges, and farming; organic chemicals that are by-products of industrial processes and petroleum production, agriculture, gas stations, storm water run-off, and septic systems; and radioactive contaminants, which can be naturally-occurring.

In order to assure that tap water is safe to drink, the Environmental Protection Agency (EPA) sets regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations set limits for contaminants in bottled water that must provide the same protection for public health.

Consumers should be aware that drinking water, including bottled water, might reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that these waters pose a health risk. More information about contaminants and potential health effects can be obtained by calling:

Liberty Dam

Loch Raven Reservoir

What are the Sources of Baltimore's Water Supply?

Baltimore uses surface water from rainfall and snowmelt as the source of its water. This water, approximately 75 billion gallons of available storage volume at maximum capacity, is collected and stored in the City-owned and operated areas of the watersheds.

Liberty Reservoir supplies raw water to the Ashburton Water Treatment Plant and is located on the North Branch of the Patapsco River.

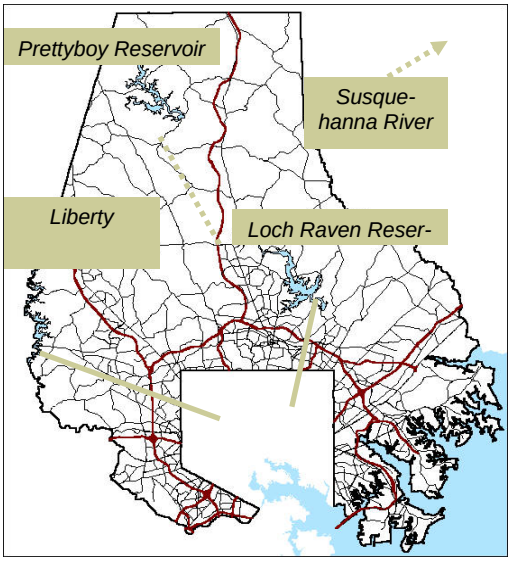
Loch Raven Reservoir supplies water to the Montebello Filtration Plants [1 and 2] and is located in Baltimore County on the Gunpowder Falls. Prettyboy Reservoir is located approximately six miles south of the Maryland and Pennsylvania State line and is within the drainage area of the Loch Raven Reservoir.

Water is released from the Prettyboy Reservoir into the Gunpowder Falls, which then drains into Loch Raven Reservoir.

The City also maintains raw supply intake facilities and an associated pumping station on the Susquehanna River. These facilities were used extensively in 2002 because of the severe drought in the northeastern part of the country.

Fortunately, since that time, precipitation has been so favorable that

We will advise when Source Water Assessment Reports, currently being compiled by the Maryland Department of the Environment, become available for re-



Baltimore City's Water Treatment Process

The following diagram shows the various stages employed in Baltimore City's water treatment process. Water normally flows by gravity from the storage reservoirs to the filtration plants, saving substantial energy costs.

However, when the Susquehanna supply is used the water must be pumped.

When the water reaches the filtration plants, sufficient chlorine is added to kill many of the microorganisms that could otherwise potentially cause illness. Additional treatment steps are also employed as added barriers to ensure that chlorine resistant organisms do not reach the finished water supply. These steps include coagulation, flocculation, sedimentation and filtration. Subsequent steps include lime addition for pH adjustment and fluoridation.

Finally, additional chlorine is added, if necessary, to ensure that a sufficient residual concentration is available in the distribution system to help protect the finished water from potential biological contaminants as it is transported to the

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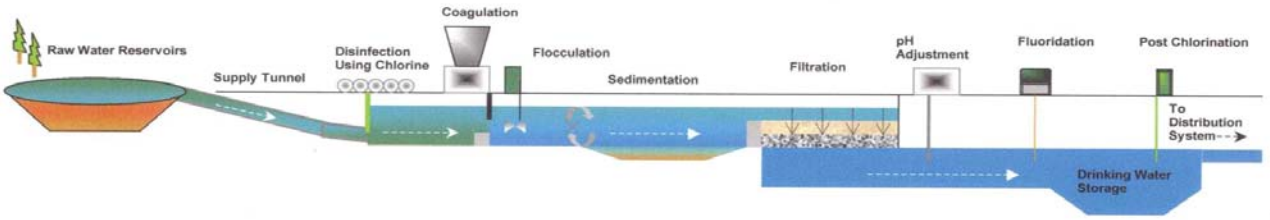

Should You Store Drinking Water?

"Water Main Breaks Disrupt Water Service to More than 200,000 customers …"

You may recall a similar headline as it appeared in local newspapers not long ago. Few things can be as disruptive to a community and to individual families as the loss, although temporary, of water service.

In the event of a large scale disruption, it may be difficult to find bottled water on grocery store shelves. We suggest that you may consider keeping several containers of purchased bottled water on hand for drinking and cooking. If a water outage is anticipated, it may be a good idea to fill the bath tub and draw from that supply for bathing, washing dishes and refilling the toilet tank. We do not recommend long term storage of tap water in containers that have not been properly

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